

### REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-8, 10-13, 16, and 18-21 are currently pending, with Claims 3, 4, 6, and 7 having been previously withdrawn from consideration. No claim amendments are presented, thus, no new matter is added.

In the outstanding Office Action, Claims 1, 2, and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yamada et al. (JP 63-037621, hereafter "Yamada") in view of Hood (U.S. Patent No. 3,510,656); Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Yamada in view of Hood and Armistead (U.S. Patent No. 5,838,759); Claims 10, 12-13, 16, 18, 20, and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yamada in view of Hood, Armistead and Cluzeau (French Patent Application FR 2 738 669); Claims 11 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yamada in view of Hood, Armistead, Cluzeau, and Kassing (German Patent Application DE 3049153 A1).

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), Applicants respectfully traverse this ground of rejection. Claim 1 recites, *inter alia*,

neutron emissive parts and neutron non-emissive parts which are juxtaposed, only the neutron emissive parts containing tritium and deuterium emitting neutrons during the bombardment with particles, said emissive and non-emissive parts being arranged so as to form a non-uniform pattern as a coded mask such that said target emits a neutron flow including plural neutron beams coded by the pattern of the mask.

Applicant's Figures 2 and 4A-4C show non-limiting examples of these features.

Figure 2 shows a target 10 that has juxtaposed emissive parts 11 and non-emissive parts 12 forming a coded mask. In this example, the target 10 is bombarded with ions of tritium and deuterium and the emissive parts 11 emit neutrons as a result (see specification at page 10, lines 12-24). Figure 3A shows the resulting flow of neutrons as beams coded by the pattern

of the mask on target 10. The emissive parts 11 are made by depositing a hydrogen fixing material 15 through a stencil 16 and forming blocks 17 as shown in Figure 4A (See page 14, lines 5-22). The hydrogen fixing material used to form the emissive parts 11 is fixed with tritium and/or deuterium nuclei (see page 2, lines 24-28).

Yamada is directed to an X-ray mask. In Yamada, the parts (8) made of gold are used to stop or to absorb X-rays and will not emit neutrons when bombarded with particles (see Figure 1d). The transmitting membrane 3 is composed of boron nitride carbide hydride and is used to transmit X-rays (see Abstract and Figure 1d).

The Office Action acknowledges that Yamada fails to disclose or suggest neutron emissive parts that contain tritium. The Office Action relies on Hood to remedy this deficiency of Yamada (see Office Action, at page 4).

Hood is directed to an X-ray source which includes a beta-particle emitting radioactive material in the presence of a target material which emits X-rays when bombarded by the beta-particles (see col. 2, lines 6-12 of Hood). The target material is in a gaseous form (see col. 2, line 12). The radioactive material is also in a gaseous form when it is tritium (see col. 2, line 34). In Hood, the target material and the radioactive material are gaseous and they are confined in a container (see col. 2, lines 13-25). During the operation of the X-ray source of Hood, the radioactive material stays in a gaseous state.

However, the tritium of Hood is used to emit beta particles and the parts 3 of Yamada are intended to be transparent to X-rays. Therefore, a person of ordinary skill in the art would not be motivated to replace the solid parts 3 of Yamada with the gaseous tritium described by Hood because of their different purposes.

The Office Action also takes the position that Hood and Yamada may be combined by "introduction of the X-ray source in a container abutting the window [as described by Hood]," and "[b]ecause tritium inherently penetrates matter, being an isotope of the smallest

atom (H), said tritium necessarily also is present in the neutron emissive parts of the Yamada et al invention within the context of said combination.” (See Office Action, at page 4). In other words, it appears that the Office Action is asserting that the combination of Yamada and Hood involves placing the X-ray source of Hood within the vicinity of the X-ray mask of Yamada, and that the tritium will inherently penetrate and become part of the neutron emissive parts 3 of Yamada’s X-ray mask.

However, Hood describes gaseous tritium in combination with a target material which is also a gaseous one in order to reduce the possible absorption of beta-particles by the radioactive material itself (see col. 2, lines 29-33). Hood does not disclose or suggest to use gaseous tritium to fix it in a solid material to emit neutrons. In Hood, the target material and the radioactive material are gaseous and they are confined in a container. During the operation of the X-ray source of Hood, the radioactive material stays in a gaseous state.

However, Claim 1 defines that “only the neutron emissive parts containing tritium and deuterium emitting neutrons during the bombardment with particles.” In other words, to have the neutron emissive parts contain the tritium and the deuterium, the deuterium and the tritium impregnate the neutron emissive parts and it is possible to obtain a high tritium density. Applicant submits that such density is not possible with a gas and that the density ratio of the claimed invention over using a gas as described by Hood is superior by approximately  $10^6$ . Therefore one of ordinary skill in the art would not use tritium in a gaseous form in the target of the present application because that would involve a large change of scale in the structure of Hood to achieve a high tritium density.

Therefore, Applicant respectfully submit Hood fails to disclose or suggest the neutron emissive parts containing tritium, as defined by Claim 1.

Thus, Hood fails to remedy the deficiencies of Yamada with regard to Claim 1.  
Therefore, Applicant submits that Claim 1 (and all associated dependent claims) patentably distinguishes over Yamada and Hood, either alone or in proper combination.

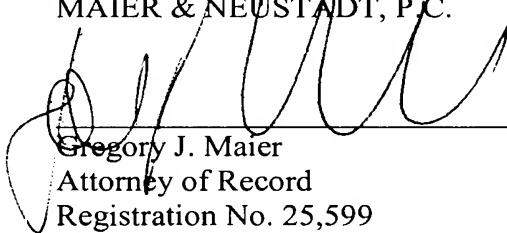
Armistead, Cluzeau, and Kassing have been considered but fail to remedy the deficiencies of Yamada and Hood with regard to Claim 1.

Thus, it is respectfully submitted that amended Claim 1 (and all associated dependent claims) patentably distinguish over Yamada, Armistead, Cluzeau, and Kassing, either alone or in proper combination.

Consequently, in light of the above discussion, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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